

SUITED CONTINGENCY OPS FOOD – 2

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ABSTRACT

The contingency scenario for an emergency cabin depressurization event may require crewmembers to subsist in a pressurized suit for up to 144 hours. This scenario requires the capability for safe nutrition delivery through a helmet feed port against a 4 psi pressure differential to enable crewmembers to maintain strength and cognition to perform critical tasks.

Two nutritional delivery prototypes were developed and analyzed for compatibility with the helmet feed port interface and for operational effectiveness against the pressure differential. The bag-in-bag (BiB) prototype, designed to equalize the suit pressure with the beverage pouch and enable a crewmember to drink normally, delivered water successfully to three different subjects in suits pressurized to 4 psi. The Boa restrainer pouch, designed to provide mechanical leverage to overcome the pressure differential, did not operate sufficiently. Guidelines were developed and compiled for contingency beverages that provide macro-nutritional requirements, a minimum one-year shelf life, and compatibility with the delivery hardware.

Evaluation results and food product parameters have the potential to be used to improve future prototype designs and develop complete nutritional beverages for contingency events. These feeding capabilities would have additional use on extended surface mission EVAs, where the current in-suit drinking device may be insufficient.